

**I CLAIM AS MY INVENTION:**

1. An electrical coil suitable for use as a gradient coil for a magnetic resonance apparatus, comprising:

at least one electrical conductor;

a carrier structure;

a cooling device component; and

a heat insulator disposed between at least one section of said conductor and said carrier structure.

2. An electrical coil as claimed in claim 1 wherein at least one section of said conductor is a hollow cylinder adapted for guiding a flowing cooling medium therein.

3. An electrical coil as claimed in claim 1 wherein said cooling device component cools at least one section of said conductor.

4. An electrical coil as claimed in claim 3 wherein at least said one section of said conductor cooled by said cooling device proceeds in an edge region of a spatial extent of said coil.

5. An electrical coil as claimed in claim 3 wherein said coil has a spatial extent forming a hollow cylinder, and wherein said at least one section of said conductor cooled by said cooling component proceeds in a region of a front side of said hollow cylinder.

6. An electrical coil as claimed in claim 1 wherein said heat insulator surrounds said conductor.

7. An electrical coil as claimed in claim 1 wherein said heat insulator has a lower thermal conductivity than said carrier structure.

8. An electrical coil as claimed in claim 7 wherein said thermal conductivity of said heat insulator is lower by a factor between 1 and 3 than the thermal conductivity of the carrier structure.

9. An electrical coil as claimed in claim 1 wherein said carrier structure comprises a resin casting.

10. An electrical coil as claimed in claim 1 wherein said carrier structure includes elements for reducing a non-homogeneity of a magnetic field in which said carrier structure and said conductor are disposed.

11. An electrical coil as claimed in claim 1 wherein said heat insulator comprises fibrous material.

12. An electrical coil as claimed in claim 1 wherein said heat insulator comprises high-resistance foam material.

13. An electrical coil as claimed in claim 1 wherein said heat insulator is composed of material selected from the group consisting of glass, ceramic, mineral materials and polymer materials